

REMARKS

Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

Status of the Claims

Claims 1-7 and 9-12 are pending. Claim 8 was previously canceled without prejudice or disclaimer. Claims 5, 6, 9, 11 and 12 have been amended. No new matter has been added.

Rejections under 35 U.S.C. § 103

Claims 1 and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,140,966 to Pankinaho in view of U.S. Patent No. 5,970,393 to Khorrami et al. (hereinafter “Khorrami”). Applicant respectfully traverses the rejection.

In the Office Action, the Examiner contends that Pankinaho discloses the features of independent claim 1 and dependent claim 10, except for a piezoelectric element attached to the planar antenna, and that the second function is periodic movement of the planar element. The Examiner relies on Khorrami as disclosing this missing structure.

Applicant submits that neither Pankinaho nor Khorrami suggest that “the periodic movement occurs in a substantial portion of the planar element beyond the location of the piezoelectric element” as recited in claim 1. In contrast, Figures 3A-3B, 7 and 9-10 of Khorrami show that the footprint of the planar element of the antenna is entirely within or equal to the footprint of the piezoelectric elements. Therefore, it is impossible to have “periodic movement [occurring] in a substantial portion of the planar element beyond the location of the piezoelectric element” as recited in claim 1 (emphasis added). Thus, the Examiner has failed to meet the burden of establishing a *prima facie* case of obviousness over claim 1. Claim 10 is allowable by reason of its dependency on allowable claim 1. Reconsideration and withdrawal of the rejection is requested.

Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pankinaho in view of Khorrami, and in further view of U.S. Patent No. 6,927,732 to Mähringer. Applicant respectfully traverses the rejection.

The Examiner contends that Pankinaho as modified by Khorrami discloses the features of the claimed invention, except that actuation of the antenna generates sound. The Examiner relies on Mähringer as disclosing the generation of sound.

Claims 2 and 3 depend upon base independent claim 1. Applicant submits that no combination of Pankinaho, Khorrami or Mähringer discloses or suggests that “the periodic movement occurs in a substantial portion of the planar element beyond the location of the piezoelectric element” as recited in base claim 1. In contrast, Mähringer discloses a piezo-ceramic layer 4 attached to a shaped membrane 2, and a shaped membrane crease 3 which encompasses the shaped membrane. (Mähringer, column 1, lines 50-54; Fig. 2.) Because of the shaped membrane crease 3, the piezo-ceramic layer in Mähringer can induce vibrations in only that portion of the radiating plane encompassed within the shaped membrane crease. This would be understood by a person of ordinary skill in the art because the crease mechanically isolates the remainder of the radiating plane. Figures 4 and 5 of Mähringer clearly show that the vibrations occur only within the shaped membrane crease. Present independent claim 1 recites that “the periodic movement occurs in a **substantial portion of the planar element beyond the location of the piezoelectric element**” (emphasis added). Thus, the Examiner has failed to meet the burden of establishing a *prima facie* case of obviousness over claims 2 and 3. Reconsideration and withdrawal of the rejection is requested.

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Pankinaho and Khorrami in view of Mähringer, and in further view of U.S. Patent No. 5,361,077 to Weber. Applicant respectfully traverses the rejection.

The Examiner contends that the combination of Pankinaho and Khorrami, as modified by Mähringer, shows and discloses the claimed invention except for a second piezoelectric or piezoceramic element on the antenna. The Examiner further relies on Weber as disclosing an overmoded acoustically coupled antenna having a second thin film resonator including a second thin film piezoelectric element.

Claim 4 depends upon base independent claim 1 and intervening dependent claims 2 and 3. Applicant submits that no combination of Pankinaho, Khorrami, Mähringer or Weber discloses or suggests that “the periodic movement occurs in a substantial portion of the planar element beyond the location of the piezoelectric element” as recited in base claim 1.

Furthermore, claim 1 recites in part that “the *radiating plane* of said antenna comprising a first branch and a second branch” (emphasis added). This describes that the first branch and the second branch are coplanar. The first piezoelectric element is “attached to said planar element” (claim 1), wherein “said planar element is the first branch of the *radiating plane*” (claim 3; emphasis added). Claim 4 recites in part “a second piezoelectric element which is attached to the second branch of the *radiating plane*” (emphasis added). Therefore, claim 4 recites a structure in which the first and second piezoelectric elements are coplanar and are attached to branches of the *radiating plane*.

In contrast, the thin film piezoelectric elements of Weber are not coplanar. Weber refers to the first thin film piezoelectric element as the “piezoelectric thin film 34,” and to the second thin film piezoelectric element as the “thin piezoelectric film 37.” Figure 1 of Weber shows that the piezoelectric thin film 34 is at the bottom of antenna 20, and thin piezoelectric film 37 is at the top of antenna 20. Therefore the thin film piezoelectric elements are not coplanar as recited by claim 4 including its base claims.

The Examiner has failed to meet the burden of establishing a *prima facie* case of obviousness over claim 4. Reconsideration and withdrawal of the rejection is requested.

Claims 5-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pankinaho in view of Khorrami, and in further view of U.S. Patent No. 5,410,749 to Siwiak et al. (hereinafter “Siwiak”).

Regarding claim 5, the Examiner contends that the combination of Pankinaho and Khorrami shows and discloses the claimed invention of claim 1 except for a piezoelectric material on the ground plane of the antenna. The Examiner further relies on Siwiak as disclosing a microstrip antenna having conductive feeders extending through apertures, and contends that the feeders of Siwiak read on “a second piezoelectric element attached to the ground plane” as recited in claim 5. The Examiner was not persuaded by our prior argument that the feeders are isolated from the ground plane, and are not a piezoelectric element. Rather, the Examiner contends in reply, among other contentions, that the feeders are coupled to the ground plane via their apertures.

Applicant has amended claim 5 to recite that the second piezoelectric element is attached to the major surface of the ground plane. This is supported by Fig. 4a of the present application, showing ground plane 420 having a major surface, with first and second piezoelectric elements 471 and 472, respectively, attached to the major surface.

Furthermore, Applicant submits that no combination of Pankinaho, Khorrami or Siwiak discloses or suggests that “the periodic movement occurs in a substantial portion of the planar element beyond the location of the piezoelectric element” as recited in base claim 1. Reconsideration and withdrawal of the rejection is requested.

Regarding claim 6, the Examiner contends that the combination of Pankinaho and Khorrami shows and discloses the embodiment of the invention claimed in claim 5, and in addition the Examiner further relies on Siwiak as disclosing conductive feeders extending through apertures,

and contends that the feeders of Siwiak read on the structure recited in claim 6. Applicant has amended claim 6 to recite that the piezoelectric elements are attached to the major surface of the ground plane. This is supported by Fig. 4a of the present application, showing ground plane 420 having a major surface, with first and second piezoelectric elements 471 and 472, respectively, attached to the major surface.

Furthermore, Applicant submits that no combination of Pankinaho, Khorrami or Siwiak discloses or suggests that “the periodic movement occurs in a substantial portion of the planar element beyond the location of the piezoelectric element” as recited in base claim 1. Reconsideration and withdrawal of the rejection is requested.

Regarding claim 7, the Examiner contends that the combination of Pankinaho and Khorrami shows and discloses the claimed invention of claim 1 except for a vibration oscillator coupled to a piezoelectric element and an oscillator for alarm vibration.

Applicant submits that no combination of Pankinaho and Khorrami discloses or suggests that “the periodic movement occurs in a substantial portion of the planar element beyond the location of the piezoelectric element” as recited in base claim 1. Reconsideration and withdrawal of the rejection is requested.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Pankinaho and Khorrami in view of Mähringer, and in further view of Japanese Patent Application No. JP 06224824 to Suzuki.

The Examiner contends that the combination of Pankinaho and Khorrami, as modified by Mähringer, shows and discloses the embodiment of the invention claimed in base claim 1, except that periodic movement of the planar element is caused by sound waves. The Examiner further contends that the Suzuki disclosure of a receiver circuit emitting an acoustic wave reads on the “sound waves coming from outside the planar element” as recited in claim 9.

Applicant disagrees with the Examiner's interpretation of Suzuki. Claim 9 recites in greater part: "said periodic movement of the planar element *is caused by* sound waves coming from outside the planar element" (emphasis added). In contrast, paragraph [0008] of Suzuki describes that movement of the piezoelectric transducer 10 is caused by receiver circuit 8 driving low pass filter 9, which in turn drives piezoelectric transducer 10. Suzuki describes that the sound waves are the product of the piezoelectric transducer having been driven by the receiver circuit, rather than the piezoelectric transducer being driven by the sound waves.

Without prejudice to this argument, Applicant have amended claim 9 to clarify that sound waves are coming from outside the integrated radio telephone structure. Support for this is found on p. 4, lines 11-14 of the original, as-filed specification, stating that the structure of Figs. 2a and 2b is being used as a microphone.

Applicant further submits that no combination of Pankinaho, Khorrami, Mähringer or Suzuki discloses or suggests that "the periodic movement occurs in a substantial portion of the planar element beyond the location of the piezoelectric element" as recited in base claim 1. Reconsideration and withdrawal of the rejection is requested.

Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Pankinaho in view of Mähringer. Applicant respectfully traverses the rejection.

The Examiner contends that Pankinaho shows and discloses the embodiment of the invention claimed in claim 11, except a piezoelectric element attached to the planar antenna. The Examiner further contends that Mähringer discloses a membrane containing a piezo-ceramic layer, allowing sound signals to be picked up.

Applicants note that due to an editing error unrelated to patentability, the phrase "beyond the location of the piezoelectric element" appearing at the end of claim 11 in the listing of claims submitted on January 26, 2006, was inadvertently omitted from the listing of claims submitted on

September 9, 2006. This omission was carried forward to the listing of claims submitted on June 8, 2007. Applicant has restored this inadvertently-omitted language. If under the circumstances support for this amendment is needed, support in the specification may be found at least in Figs. 2a and 3.

Applicant submits that neither Pankinaho nor Mähringer suggest that “the piezoelectric element induces the periodic movement of a substantial portion of the planar element beyond the location of the piezoelectric element” as recited in claim 11. In contrast, Mähringer discloses a piezo-ceramic layer 4 attached to a shaped membrane 2, and a shaped membrane crease 3 which encompasses the shaped membrane. (Mähringer, column 1, lines 50-54; Fig. 2.) Because of the shaped membrane crease 3, the piezo-ceramic layer in Mähringer can induce vibrations in only that portion of the radiating plane encompassed within the shaped membrane crease. This would be understood by a person of ordinary skill in the art because the crease mechanically isolates the remainder of the radiating plane. Figures 4 and 5 of Mähringer clearly show that the vibrations occur only within the shaped membrane crease. Present independent claim 11 recites that “the piezoelectric element induces the periodic movement of a **substantial portion of the planar element beyond the location of the piezoelectric element**” (emphasis added). Thus, the Examiner has failed to meet the burden of establishing a prima facie case of obviousness over claim 11. Reconsideration and withdrawal of the rejection is requested.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Pankinaho and Khorrami in view of Weber, and in further view of Siwiak.

The Examiner contends that Pankinaho “fails to specifically disclose that there is a piezoelectric element attached to the planar antenna, and that a second function is the movement of the planar element”; the combination of Pankinaho and Khorrami “fails to specifically disclose that there is a piezoelectric element attached to the planar antenna”; the combination of Pankinaho, Khorrami and Weber “fails to specifically disclose that there is a piezoelectric element attached to an oscillator,” but further contends that Siwiak discloses an oscillator attached to the antenna.

Applicant has amended claim 12 to recite that the periodic movement of the planar element occurs beyond the location of the piezoelectric elements. This distinguishes over any combination of Pankinaho, Khorrami, Weber and Siwiak. Reconsideration and withdrawal of the rejection is requested.

CONCLUSION

Each and every point raised in the Office Action dated August 27, 2007 has been addressed on the basis of the above amendments and remarks. In view of the foregoing it is believed that claims 1-7 and 9-12 are in condition for allowance and it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Dated: February 27, 2008

Respectfully submitted,

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